REV-01
BMB/01/04

2023/08

**SET A**

**B.Sc. MICROBIOLOGY**
**FIFTH SEMESTER (SPECIAL REPEAT)**
**BIOINFORMATICS**
**BMB-503**
**[USE OMR SHEET FOR OBJECTIVE PART]**

**Duration: 3 hrs.** **Full Marks: 70**

**Objective**

**Time: 30 mins.** **Marks: 20**

***Choose the correct answer from the following:*** ***1×20=20***

1. Which of the following database is of short sequence pattern and profile of protein?
   a. PROSITE b. iProclass
   c. PDB d. Pfam

2. Which of the following measures is not affected by the extreme values?
   a. Median b. Mean
   c. Standard deviation d. None of the above

3. _____is the best measure of dispersion.
   a. Mean b. Standard deviation
   c. Mean deviation d. None of the above

4. The best relative measure of dispersion is_____.
   a. Coefficient of range b. Coefficient of Mean Deviation
   c. Coefficient of Variation d. None of the above

5. In a Poisson distribution with mean 4, then the variance is:
   a. 2 b. 4
   c. 0 d. None of the above

6. The number of girls in a family of four children, is an example of:
   a. Binomial distribution b. Poisson distribution
   c. Normal distribution d. None of the above

7. Degree of freedom is not associated with:
   a. t test b. Chi-square test
   c. F test d. Z test

8. If the calculated value of the test statistic is greater than its critical value, then:
   a. The null hypothesis is not rejected b. The null hypothesis is rejected
   c. No conclusion d. None of the above

9. The two variables X and Y are independent, the correlation coefficient between X and Y is:
   a. +1 b. -1
   c. ±1 d. 0

10. The product of two regression coefficients, is:
    a. Less than or equal to 1 b. Greater than or equal to 1
    c. Equal to 1 d. None of the above

11. Which of the following transposons is found in yeast?
    a. Ty elements
    b. Copia elements
    c. Retroviral elements
    d. LINES and SINES

12. Tandem repeats of almost 6 base pairs are called:
    a. Microsatellite
    b. Minisatellites
    c. VNTR
    d. Both b and c

13. Which language is used by Relational database?
    a. SQL
    b. JAVA
    c. Both a and b
    d. None

14. Which of the entity in RDBMS is called an attribute?
    a. Row
    b. Column
    c. Table
    d. All

15. Which of the following file transfer protocol is used over remote network?
    a. FTP
    b. SFTP
    c. TCP
    d. SSH

16. What is the size of haemophilusinfluenzae genome?
    a. 1.8 kb
    b. 1800 bp
    c. Both
    d. None

17. Which tool is for aligning translated nucleic acid 1 with translated nucleic acid 2?
    a. tblastx
    b. tblastn
    c. Phi blast
    d. All

18. Which of the following is a molecular structure database?
    a. PDB
    b. MSD
    c. Both
    d. None

19. Which of the peptides will be least deflected by magnetic field in mass spectrometry?
    a. 120 KDA
    b. 350 KDA
    c. 1256 KDA
    d. 100 KDA

20. Global query is a feature of:
    a. Entrez
    b. SRS
    c. Both
    d. None

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## Descriptive

**Time : 2 hr. 30 mins.** **Marks : 50**

[ Answer question no.1 & any four (4) from the rest ]

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|---|---|---|
| 1. | a) Highlight the difference between eukaryotic and prokaryote genome with diagram. | 5 |
| | b) Write a note on secondary protein database. | 5 |
| 2. | a) How BLAST is performed? What is e value? | 6 |
| | b) What are the different types of BLAST? | 4 |
| 3. | a) Define Population, Sample, Parameter and Statistic. | 4 |
| | b) A pharmaceutical company maintains that the mean time for a drug to take effect is 24 minutes. In a sample of 100 trials, the mean time is found to be 26 minutes with a standard deviation of 4 minutes. Can you say that the claim of the company is justified at 5% level of significance? [Given, the critical value of the test statistic at 5% significance level is 1.645] | 6 |
| 4. | a) What is sequence homology? Write the steps of MSA? Which is the best method of phylogenetic alignment? Explain. | 2+2+4=8 |
| | b) Differentiate between motif and domain. | 2 |
| 5. | a) Write the properties of Poisson distribution. | 4 |
| | b) If the probability of infection of COVD 19 is 20% in a certain place, what is the probability that out of 10 randomly selected people in the same place:<br>i) Two are infected<br>ii) At least three are infected | 6 |
| 6. | Find mean, median, mode, standard deviation and coefficient of variation for the following distribution:<br>Class : 10 – 20 20 – 30 30 – 40 40 – 50 50 – 60<br>Frequency: 5 8 12 16 18 | 10 |
| 7. | Explain 2D gel electrophoresis with diagram. Write the significance of SDS in SDS PAGE. | 10 |
| 8. | a) Differentiate between local and global alignment. | 5 |
| | b) Create PAM alignment for the following protein sequence<br>AALVY<br>ALLID | 5 |

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